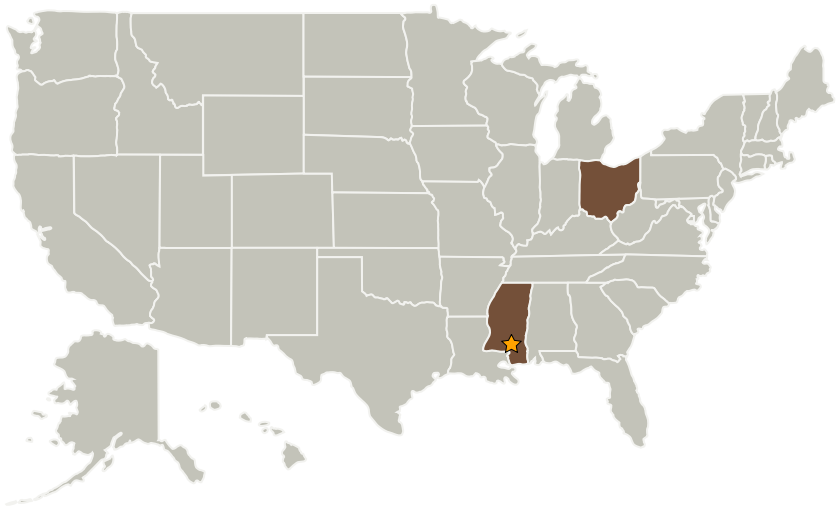
Universal Smart Sensor Interface, Phase I

Completed Technology Project (2009 - 2009)

Project Introduction

Ground testing of propulsion systems requires highly accurate and precise sensor systems. Setting up such systems can be more time consuming than the test. The myriad of analog connections are subject to environmental noise. The ability to effectively calibrate sensors, digitize the signals in closer proximity to the sensor itself and to send real-unit data with sensor identification and time stamps is critical. IEEE1451 provides specification for "smart sensors" of this type. Sensor fidelity and reliability are enhanced when the electronics are closer to the sensor. This is difficult in propulsion systems because of the ambient temperatures. High temperature electronics improve performance of such systems. Orbital Research previously demonstrated electronics that drive sensors, digitize the results and provide data analysis using a high performance, high temperature microprocessor. The system has a common bus for transmitting the data. The demonstrated system interfaces with any one of 8 sensor types. During this program the system will be refined and expanded to enable multi-variate calibration, sensor identification, and time stamping. Ensuring adequate resolution for the ground test sensors is also a key objective. It will also require software development to accomplish the identified smart sensor functionality. All developments will be compliant with IEEE1451.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Stennis Space Center (SSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Stennis Space Center(SSC)	Lead Organization	NASA Center	Stennis Space Center, Mississippi
Orbital Research, Inc.	Supporting Organization	Industry	Cleveland, Ohio

Primary U.S. Work Locations	
Mississippi	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
  - TX13.2 Test and Qualification
    - TX13.2.7 Test Instruments and Sensors